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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

VAUGHN, MEGANN E

ART UNIT	PAPER NUMBER
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2859

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/541,449	Applicant(s) GRASSLIN ET AL.	
	Examiner Megann E. Vaughn	Art Unit 2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2006.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 14-19 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

The specification as originally filed fails to disclose or fairly suggest the step wherein "the relative amplitude of each of the individually amplitude adjusted RF signals are adjusted by distribution patterns of the first and second distribution networks." One of ordinary skill in the art at the time that the invention was made would not have been able to conclude from the original disclosure an existing pattern for the data distribution and the effect of said pattern in the procedure of amplitude adjustment of the RF signal as required in claim 11.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 11-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With respect to claim 11, the recitation of "the relative amplitude of each of the individually amplitude adjusted RF signals being adjusted by distribution pattern of the first and second distribution networks," is not mentioned in the original specification as discussed above in paragraph 1.

With respect to claims 12-17, the previous rejection of claim 11 above applies due to their dependency on claim 11.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 18-19 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The claimed invention is directed to a judicial exception to 35 U.S.C. 101 (i.e., an abstract idea) and is not directed to a practical application of such judicial exception (e.g., because the claim does not require any physical transformation and the invention as claimed does not produce a useful, concrete, and tangible result). The language in the claim suggests only a combination of instructions (e.g. distributing RF signals to power amplifiers, the output of which are then distributed to a plurality of resonators through a plurality of RF channels) without reciting a structure associated to the procedure and **lacks a tangible result** at the end of the procedure.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-7, 9, 10, and 18-19 are rejected under 35 U.S.C. 102(a) as being anticipated by Leussler (WO 02/095435).

Regarding claim 1, Leussler discloses in figure 1, a high-frequency system for an MR apparatus with a high-frequency coil arrangement comprising a plurality of resonator elements (104), which coil arrangement is coupled to a transmit unit (106), where a respective transmit channel (1-8) of the transmit unit (106) is assigned to the resonator elements (104), wherein the transmit unit (106) comprises a plurality of high-frequency amplifiers (107), the inputs of which can receiver low-power transmit signal via a first controllable multiplexer/distributor network (108) (page 8, lines 2-6).

Regarding claim 2, Leussler discloses in figure 1 a high-frequency system as claimed in claim 1, wherein a control unit (111) is assigned to the transmit unit (106) (page 8, lines 9-11).

Regarding claim 3, Leussler discloses in figure 1 that the high-frequency amplifiers (107) of the transmit unit have a gain factor. It is well know in the art that every amplifier has a gain factor.

Regarding claim 4, Leussler discloses in figure 1 a high-frequency system as claimed in claim 3, wherein measurement sensors (117), coupled to the control unit (111), serve for determining the high-frequency field strength generated by means of the individual resonator elements (104) (page 8, lines 23-26).

Regarding claim 5, Leussler discloses in figure 1, a plurality of controllable high-frequency signal generators (111) for generating the low-power transmit signals (page 8, lines 9-11).

Regarding claim 6, Leussler discloses in figure 1, that the amplitudes and phases of the high-frequency signals supplied to the resonator elements (104) via the transmit channels (1-8) are individually preselectable (page 8, lines 3-4).

Regarding claim 7, Leussler discloses in figure 1, a receive unit (112) with a plurality of receive channels (a-j) assigned to the respective resonator elements (104).

Regarding claim 9, Leussler discloses in figure 1, a MR apparatus with a main field coil for generating a homogeneous, static magnetic field in an examination volume (100), a number of gradient coils (103) for generating magnetic field gradients in the examination volume (100), a high-frequency system for generating high-frequency fields in the examination volume (100) and for acquiring MR signals from the examination volume (100), and with a central control unit (111) for activating the gradient coils (103) and the high-frequency system, and a reconstruction and display unit (115, 116) for processing and displaying the MR signals, wherein the design of the high-frequency system.

Regarding claim 10, Leussler discloses in figure 1, an array of transmit/receive switches (S) which , in a transit mode connect the channels of the transmit unit with the resonator elements and, in a receive mode, connect the channels of the receive unit with the resonator elements (page 7, lines 29-33).

Regarding claim 18, Leussler discloses a magnetic resonance method comprising, distributing a plurality of low power RF signals among inputs to a plurality of power amplifiers (page 8, lines 1-2); distributing outputs of the plurality of power amplifiers among a plurality of RF channels (page 8, lines 1-2); during a transmit mode, connecting the RF signals from the plurality of RF channels to a plurality of resonator elements (page 7, line 34- page 8, line1).

Regarding claim 19, Leussler discloses that during a receive mode, connecting the plurality of resonator elements with a plurality of receiver channels (page 8, lines 12-14).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leussler (WO 02/095435) in view of Bock et al (US 6549799).

Leussler discloses the high-frequency coil arrangement as discussed above in paragraph 5.

Leussler does not disclose isolators.

Bock et al discloses in figure 1 an MRI apparatus with a plurality of RF transmitter coils with isolators (27, 27', 27'') connected to the output of the high-frequency amplifier (31). Therefore it would have been obvious to a person having ordinary skill in the art at the time that the invention was made to add isolators to the output of the amplifiers disclosed by Leussler in order to provide isolation between any RF power source and receivers, transmitters, and RF coils (column 10, lines 46-48), in order to prevent any unwanted frequency interference that could disturb the final MRI image.

8. Claims 11, 12, 14, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leussler (WO 02/095435) in view of Visser et al (US 6870368).

Regarding claim 11, Leussler discloses in figure 1 a magnetic resonance system comprising a plurality of resonator elements (104) disposed adjacent an examination volume;

a transmit unit for applying a plurality of RF signals of individually adjustable amplitude to each of the resonator elements, the transmit unit including:

a plurality of power amplifiers (107); and

a first, controllable distribution network (108) which controllably distributes simultaneously one or more lower power RF input signals among the plurality of power amplifiers.

Leussler does not disclose a second controllable distribution network.

Visser et al discloses in figure 7, a MRI apparatus and method for selectively routing/diverting and combining transmitting or receiving (column 1, lines 13-18) RF signals, wherein each of the RF coils (resonators) have a separate preamplifier (50) and a distributor network (switches 52) for distributing the output signals of the preamplifiers (50) to a particular multiplexer (adder/combiner 53), together the switches and adder/combiner can be considered a multiplexer/distributor network (column 5, lines 14-24). Therefore it would have been obvious to a person having ordinary skill in the art at the time that the invention was made to use a combination of switches and adder/combiners as taught by Visser et al as a second, controllable distribution network to distribute output signals from the plurality of amplifiers disclosed by Leussler in order to control the selection and combination of RF signals that would result in an improved image.

Regarding claim 12, Leussler discloses in figure 1, a plurality of receive channels (a-j), a plurality of transmit/receive switches (S) for selectively interconnecting the resonator elements with the transmit unit and the receive channels (page 7, lines 29-33).

Regarding claim 14, Leussler discloses in figure 1 a control network (111) for controlling the first and second controllable distribution networks to control relative amplitudes of RF signals supplied to each of the resonator elements.

Regarding claim 16, Leussler discloses in figure 1 a plurality of high frequency signal generators (106) for supplying high frequency signals to the first distribution network (108) to be distributed among the plurality of power amplifiers.

Regarding claim 17, Leussler discloses that the high frequency generators control at least phases of the signals supplied to each resonator element (page 8, lines 3-4).

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leussler (WO 02/095435) in view of Visser et al (US 6870368) as applied to claims 11, 12, 14, 16, and 17 above, and further in view of Leussler (US 6909518).

Regarding claim 15, Leussler and Visser et al disclose the magnetic resonance system as discussed above in paragraph 8. Leussler does not disclose specifically that the gain-factor for each power amplifier can be controlled via the control unit.

Leussler (6909518) discloses amplifiers wherein the gain of the amplifiers can be adjusted independently of one another using a control unit (column 4, lines 55-63). Therefore it would have been obvious to a person having ordinary skill in the art at the time that the invention was made to independently adjust the gain, as taught by Leussler (6909518), of the amplifiers disclosed by Leussler and Visser et al in order to control the individual strength of each RF signal and to obtain a desired strength for each signal to improve the MR image.

Allowable Subject Matter

10. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance:

Claim 13 is allowable over the prior art of record because the prior art of record does not teach or disclose a high-frequency system for an MR apparatus with a high-frequency coil arrangement comprising a plurality of sensors disposed adjacent the examination region to sense RF signals in the examination region and provide feedback information to the control unit for adjusting the first and second distribution networks, in combination with the remaining limitations of the claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

11. Applicant's arguments regarding claims 1-19, filed 6/22/2006 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "a pair of distribution networks, one upstream and the other downstream from a plurality of amplifiers (page 12, lines 4-5)") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the

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specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Furthermore, regarding claims 1 and 3, the examiner points out that limitations in claim 1, "...high-frequency amplifiers, the inputs of which **can** receive low-power transmit signals via a first controllable multiplexer/distributor network, in which the output signals of the high-frequency amplifiers **can be** distributed over the transmit channels via a second controllable multiplexer/distributor network", and the limitation in claims 3, "...the gain factor of each high-frequency amplifier of the transmit unit **can be** controlled via the control unit", are not positively recited. The claim language does not suggest that said limitations are definitely inclusive.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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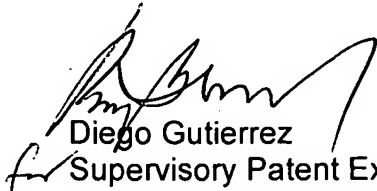
the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Megann E. Vaughn whose telephone number is 571-272-8927. The examiner can normally be reached on 8 am- 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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10/6/2006


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